



Metabolism

Metabolism put simply includes all the reactions happening inside your body, providing your organs with the requirements they need to function and to keep you alive. The body itself is very intelligent in that all body systems complement each other, however energy in the form of food is required for the body to function.

Food is metabolised in your body during the digestive process which provides key nutrients including vitamins and minerals. Digestive enzymes are naturally occurring and are required to aid in the digestion process, ensuring the proteins, carbohydrates (sugars) and fats you have eaten are available to be used in metabolism, providing energy for your body. However, it is important that the digestive process occurs properly. Supplementation with good quality digestive enzymes may aid in enhancing digestion for you.

Metabolism of proteins, carbohydrates (sugars) and fats all occur differently and are explained below.

Sugar Metabolism

Sugars (glucose, fructose and galactose) are the basic building blocks of carbohydrates, forming both complex and simple carbohydrates. Sugar metabolism primarily results in energy production by breaking down the carbohydrate into simple sugars. These include glucose, fructose and galactose. Although glucose is the preferred source for energy production as it is more readily available to be used in ATP (energy) production.

ATP is utilised as the main source of energy throughout all body systems. It is used to be able to transport molecules throughout the body, start or stop chemical reactions, control muscle contraction and nerve impulses.

It is important that complex carbohydrates are the preferred carbohydrate to be eaten over simple/refined carbohydrates as these provide the body with more glucose. Otherwise, fructose and galactose are required to be converted to glucose first, requiring cellular energy, making it a less efficient process in producing energy. Additionally, simple/refined carbohydrates can contribute to systemic inflammation and so are best limited.

Although protein and fat can also be used for energy production, they are also not as readily available as glucose and therefore not the preferred source. However, they have many other important functions (see below).

Sources of Complex Carbohydrates to Include	Sources of Simple Carbohydrates to Limit
Fruit and vegetables high in fibre, whole grains (quinoa, buckwheat, whole grain pasta, oats), beans, legumes.	Cakes, cookies/biscuits, fruit juice, breakfast cereals, white breads, chips, chocolate, lollies.

Protein Metabolism

Protein is needed by every living organism, and next to water, makes up the largest portion of our body weight since it is contained in muscles, organs, hair, etc. The protein used in making up the body is not directly derived from diet, but the dietary protein is broken down into amino acids, and the body then re-constitutes these amino acids into the specific proteins needed.



Metabolism - Continued

Enzymes and hormones regulating body functions are also proteins. Amino acids are used in most body processes from regulating the way the body works to how the brain functions—they activate and utilize vitamins and other nutrients.

Digestive enzymes are required to break down proteins into amino acids. Specific enzymes for protein digestion are referred to as proteases. Protein metabolism then results in the production of clotting factors (help your blood to clot when bleeding) as well as providing amino acids which are re-used to form new proteins required for bodily functions.

There are essential amino acids and non-essential amino acids that the body requires to function. Essential amino acids are required from the diet as the body cannot produce them itself. Therefore, it is important that your diet contains 'complete' sources of proteins as they contain all these essential amino acids. However, if you make sure you have the right combination of 'incomplete' protein sources, then you may be meeting your requirements. Talking to a health professional further about this is important to ensure you are not missing any in your diet.

Complete Protein Source Examples	Incomplete Protein Source Examples
Meat, fish, milk, yoghurt, cheese, eggs, quinoa, pumpkin seeds, buckwheat, hemp, soybeans.	Legumes, beans, vegetables, cereals, grain products, nuts, seeds.

Fatty Acid Metabolism

Essential fatty acids (EFA's) are 'essential', as the body cannot produce them itself and must obtain them from dietary sources. Though you have probably often heard the word 'fats' and associated it with bad health, there are some essential fatty acids that are necessary for your survival.

EFA's play a role in virtually every human function including growth and development, digestion, brain and nerve function, immune function, hormone production and regulation, maintenance of skin and bones, regulation of healing and inflammation, heart function, vision, cholesterol levels, and even emotions and behaviour. EFA's are also required for proper nerve signal transmission (memory, concentration, cognitive ability, muscle coordination and strength).

EFA's are used for energy production, providing the most energy (9kj per gram) compared to carbohydrates and fats. However, lipases (enzymes) are used to metabolise EFA which result in the function above.

The two types of EFA's include omega-3 and omega-6. Lots of focus is on omega-3 EFA's, however they are both as important to include in your diet

Omega 3 Sources	Omega 6 Sources
Mackerel, salmon, cod liver oil, oysters, sardines, chia seeds, flax seeds.	Walnuts, hemp seeds, sunflower seeds, peanut butter, tofu, avocado oil, eggs, almonds, cashews.

We recommend that you get your epigenetics tested regularly to prevent metabolism and wellbeing challenges.